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The Effect of Mechanical Plaque Control on the Clinical Parameters of Human Periodontal Disease

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Abstract

THE EFFECT OF MECHANICAL PLAQUE CONTROL ON THE CLINICAL PARAMETERS OF HUMAN PERIODONTAL DISEASE

by

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The purpose of this investigation was to determine the degree of healing which takes place in the periodontal tissues as a result of supragingival and subsequent subgingival plaque control attempts without any associated supra- or subgingival instrumentation and root planing.

Seven patients with moderate to severe periodontitis were finally selected for the study. Measurements were made on maxillary and mandibular incisors, cuspids and premolars to establish base line plaque scores, bleeding scores, probing pocket depths, and probing attachment levels. The patients were then instructed in the use of toothbrushes, dental floss and interdental brushes where indicated. Measurements were repeated at monthly intervals until no significant changes in any of the clinical parameters were noted for two consecutive months. At this time the Perio-Aid® was introduced for the purpose of subgingival plaque control. Examinations were continued for three additional months. During the 5-month supra-

gingival experimental period the mean plaque scores were reduced from 74% to 7%, mean bleeding on probing scores from 72% to 41%, and mean probing pocket depth from 4.4 to 3.9mm. The mean reduction of probing pocket depth of 0.5mm was the result of 0.2mm loss of attachment and 0.7mm gingival recession. Most of the changes in gingival topography occurred within the first month of the study, whereas bleeding scores showed a gradual reduction during the initial 3-4 months of the experimental period. There was no further change in clinical parameters after the introduction of the Perio-Aid® at the 5-month examination.

In conclusion, limited changes occurred in the periodontal tissues following supragingival plaque control without any associated instrumentation.

LOMA LINDA UNIVERSITY

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A Thesis in Partial Fulfillment of the Requirements for the Degree Master of Science in the Field of Periodontology

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Each person whose signature appears below certified that this manuscript in his opinion is adequate, in scope and quality, in lieu of a thesis for the degree Master of Science.

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INTRODUCTION

There seems to be little doubt that oral hygiene procedures can eliminate or reduce gingivitis (see review by Lindhe, Lundgren & Nyman, 1970). For example, Koch & Lindhe (1965) observed that daily supervised toothbrushing in 11-12 year old children significantly reduced the level of gingivitis as compared to non-treated controls. Loe, Theilade & Borglum-Jensen (1965) found that gingivitis, induced in young adults by withdrawal of oral hygiene procedures, could be reversed by reinstitution of tooth cleaning.

Only a few studies, however, provide information regarding the effect of plaque control on periodontitis (periodontal pockets with subgingival plaque and calculus). Also, the number of sites studying the effect of plaque control in these studies is limited. Tagge, O'Leary & El-Kafrawy (1975) studied 3 buccal or lingual sites in each of 22 patients; a control site, an oral hygiene only site, and an oral hygiene plus root planing site. The sites for oral hygiene only had an initial mean probing depth of 2.9mm. After 8 weeks, these 22 sites had a mean probing depth of 2.3mm, a reduction of 0.6mm. A reduction in gingival inflammation was also noted in sites that received oral hygiene only. Hellden, Listgarten & Lindhe (1979) observed the response of perio-

dontal pockets to oral hygiene in six patients. Half mouth of each patient received oral hygiene alone and only regions with probing depths initially exceeding 3mm were included. The initial mean probing depth in these patients was 5.5mm. After 25 weeks the mean probing depth was 4.7mm, a statistically significant reduction of 0.8mm. There was also a statistically significant reduction in gingival inflammation in these areas. In a separate report, Listgarten, Lindhe & Hellden (1978) presented what happened to the deepest pockets of their patients. The initial mean probing depth of the total of 18 sites that were used for oral hygiene only was 7.0mm. After 25 weeks the mean probing depth was 6.5mm, a change of 0.5mm which was not statistically significant. Neither was there any statistically significant change in gingival inflammation.

Thus, our information on the effects of oral hygiene alone without concomitant instrumentation on periodontitis is limited. Furthermore, there seems to be no knowledge regarding the usefulness of attempts at <u>subgingival</u> mechanical plaque control. It was therefore the intent of this study to determine the effects of supragingival and subsequent subgingival mechanical plaque control on periodontally involved patients with pockets of varying depths.

MATERIALS AND METHODS

Subjects

Ten human adults, 35-64 years of age, four males and six females were initially selected, however, 3 were subsequently dropped from the study. They were free from any interfering systemic pathology. The patients had generalized chronic periodontitis as evidenced by loss of clinical attachment level with gingival inflammation and bleeding on probing. They showed subgingival calculus and had not been exposed to periodontal treatment within the last ten years. The number of teeth examined ranged from 6 to 20 teeth per patient. The teeth examined were incisors, cuspids, and bicuspids having soft tissue probing depth $\geq$ 5mm on at least two surfaces.

Clinical Parameters Measured

The clinical parameters measured were plaque scores, bleeding scores, probing pocket depths, and probing attachment levels. All parameters were measured by one and the same examiner (A) at monthly examinations throughout the study. At each examination, bleeding scores were taken first followed by plaque scores. Probing pocket depths and probing attachment levels were then taken. All parameters were measured at six sites of each tooth: mesio-buccal, mid-buccal, disto-buccal, mesio-lingual, mid-lingual and disto-lingual.

A second examiner (B) also measured the probing pocket depths and probing attachment levels at the initial examination and at the 1-, 5- and 8-month examinations for the purpose of evaluation of interexaminer reproducibility. The two examiners alternated the order of measurements on every other patient at these examinations.

Plaque scores: Plaque scores were calculated as a percentage of surfaces examined demonstrating plaque. Patients rinsed with an erythrosine dye, (Trace®, Lorvic Corporation, St. Louis, MO, USA) prior to taking plaque scores. Areas that had stained deposits which could be easily removed with the side of a probe were scored as having plaque. Only plaque approximating the gingival margin was scored.

Bleeding scores: Bleeding scores were calculated as a percentage of surfaces examined having bleeding after probing. Probings were made with a 0.4mm diameter probe tip attached to an electronic pressure sensitive probe (Electronic Periodontal Probe, model 200, Vine Valley Research, Middlesex, N.Y., USA) using a standardized force of 50 ponds. The probe was moved in an apical direction twice, without removing from the pocket, to ensure locating the bottom of the pocket, then removed and the site observed for signs of hemorrhage.

Probing pocket depth and probing attachment level: Measurements of probing pocket depth and probing attachment

level were made to the nearest half mm with a specially machined probe having 1mm increments and 0.4mm diameter. A soft acrylic onlay (Scheu-Dental, Iserlohn, West Germany) was used to provide reference points for the probing measurements. The probe was placed at the anatomic mid-buccal and mid-lingual aspects of the tooth and directed longitudinally for mid-buccal and mid-lingual measurements. For proximal measurements, the probe placement was guided by the interdental indentations of the thin onlay and the probe was directed towards the anatomic mid-proximal aspects. The probing attachment level was the distance measured from the onlay margin to the tip of the probe. The probing pocket depth was measured from the gingival margin to the tip of the probe.

Gingival recession: Gingival recession was a calculated change using the distance from the onlay margin to the gingival margin at initial examination compared to the distance from the onlay margin to the gingival margin at subsequent examinations.

Experimental Procedures

Following the initial examination, the patients were given oral hygiene instructions in a series of four weekly visits. Patients were instructed in the use of multitufted

soft toothbrushes, dental floss or synthetic yarn and interdental brushes as needed. To further participate in the study patients were required to achieve a plaque score of 10% or less during the four weeks of initial instruction. Monthly examination were conducted until the parameters of bleeding scores and probing pocket depth stabilized for two consecutive examinations. After 5 months of the study, three patients were excluded from further study due to inadequate plaque control (mean plaque scores >10%). The remaining seven patients were then instructed in the use of the Peiro-Aid® (Marquis Dental Mfg. Co., Aurora, Colorado, USA) for the purpose of attempted subgingival plaque control. The patients were instructed to insert the tip of the Perio-Aid® below the gingival margin as deeply as possible and to work it around the circumference of the accessible parts of the teeth. The patients were repeatedly asked to demonstrate their ability to manipulate the Perio-Aid® subgingivally into pockets. Monthly examinations continued until no further change in the clinical parameters was evident. The analysis of the data was limited to the seven patients that completed the entire study, except for the evaluation of the inter-examiner reproducibility which included all ten individuals at all examinations except the 8-month examination.

The experimental design in shown in Fig. 1.

RESULTS

Plaque Scores

Plaque scores at the initial examination ranged from 38% to 99%, with a mean of 74%. One month following start of oral hygiene instruction and throughout the 8-month experimental period the mean plaque scores were reduced below 10% (Table 1). The plaque scores were somewhat higher at surfaces with deep pockets. Areas with initial probing depths of $\leq$3.5mm had initial plaque scores of 61% which were reduced to 3-5% throughout the study, whereas deeper sites had initial plaque scores of 90% which were reduced to 8-12% (Table 2). There were no further changes after the introduction of the Perio-Aid® at the 5 month examination.

Bleeding Scores

Bleeding scores at the initial examination ranged from 43% to 98% with a mean of 72%. These scores were gradually reduced to approximately 45% during the first five months of the experimental period. Most of the decrease took place during the initial two months (Table 3). Deeper pockets had a higher bleeding score initially than shallower sites and there was less reduction of bleeding in the deeper pockets throughout the study. Areas with probing pocket depth $\leq$3.5 mm had initial bleeding scores of 61% and were reduced to 26%

at the end of the 8-month experimental period. Sites with probing pocket depths of 4.0-5.5mm had initial bleeding scores of 83% and were reduced to 54%. Areas with probing depths ≥6mm had initial bleeding scores of 89% and were reduced to 64% (Table 4). There was no further change in bleeding scores after the introduction of the Perio-Aid® at the 5-month examination.

Probing Pocket Depth

The initial mean probing pocket depth for all patients was 4.4mm with an individual mean range of 3.5mm to 5.3mm. The mean probing pocket depth was reduced approximately 0.5 mm. This change occurred within the first two months of the study (Table 5). Reduction of pocket depth was most obvious on the proximal surfaces, approximately 0.6mm, while buccal surfaces showed very little reduction, 0.1mm and lingual surfaces had 0.3mm of reduction (Table 6). More probing pocket reduction occurred in deeper than in shallow sites. Surfaces with initial probing depth ≤3.5mm were reduced an average of 0.2mm, while surfaces with probing depth of 4.0-5.5mm were reduced around 0.5mm. Deep sites, ≥6mm, showed the greatest reduction, approximately 0.8mm (Table 7). There was no further change after the introduction of the Perio-Aid® at the 5-month examination.

Probing Attachment Level

Measurements of probing attachment levels indicated a mean loss of 0.1-0.3mm over the experimental period (Table 8). Examination of the individual surfaces revealed that buccal surfaces showed a tendency to more loss of attachment than proximal and lingual surfaces (Table 9). The initial depth of the pockets appeared to have no relationship on the change in probing attachment level (Table 10). There was no further change in the probing attachment level after the introduction of the Perio-Aid® at the 5-month examination.

Gingival Recession

The mean amount of gingival recession at the 8-month examination was 0.8mm. Most of the recession occurred in the first month of the study (Table 11). Proximal sites appeared to respond somewhat more than buccal and lingual surfaces (Table 12). Deeper sites had more recession than shallow areas. Initial probing pocket depth $\leq$3.5mm had 0.6mm of recession at 8 months while areas with initial probing depths 4.0-5.5 had 0.8mm. The areas with initial probing depths $\geq$6mm showed 1.2mm of recession at 8 months (Table 13). There was no apparent effect of the Perio-Aid® after it was introduced at 5 months.

Reproducibility of Probing Measurements

The reproducibility of recordings of probing pocket depth and probing attachment level is presented in Table 14. Over 90% of measurements were reproduced within ±1.0mm, with 96% within ±1.5mm.

DISCUSSION

The present study investigated the effect of mechanical plaque control without concomitant instrumentation on the clinical parameters of periodontitis. Initially ten patients were used for the study. All ten individuals were included in the interexaminer reproducibility data. Three of the patients, however, were deleted after the 5-month supragingival plaque control phase due to inadequate plaque scores. The presented data is on the final seven patients and although this is a small group all patients seemed to respond similarly.

The results of the present study show what could be accomplished with mechanical plaque control only. Toothbrushes and dental floss were used for supragingival plaque control. Due to the nature of this study, monitoring plaque control was very important. The patients were evaluated at monthly examinations, but the patients' daily effort could not be checked. However, the mean plaque scores for the group of seven patients at each examination were reduced to below 10%. Also, there was an improvement in bleeding scores, particularly in shallow pockets, from 61% to 26%. This combined data indicates that regular supragingival plaque control efforts were practiced by the patients.

Bleeding scores in deeper pockets were not reduced as much as in shallow pockets. Sites with probing depths of 4.0-5.5mm had initial bleeding scores of 83% which were reduced to 54% while deep areas, ≧6mm, had initial bleeding scores of 89% which were reduced to 64%. An explanation to this variation may be that in deeper pockets an established subgingival microflora with subgingival calculus was present that was less affected by supragingival plaque control. Shallow pockets may be primarily associated with a marginal gingivitis that responded more readily to plaque control.

The reduction in probing pocket depth was 0.2mm for surfaces with initial probing depth ≦3.5mm. Sites with initial probing depths of 4.0-5.5mm had 0.5mm of reduction. Tagge et al. (1975) noted 0.6mm of pocket reduction in sites with initial probing depth of 2.9mm. Deep sites, ≧6mm, had a reduction of 0.8mm which compared with the results from deep pockets of Hellden et al. (1979).

Throughout the study there was a limited tendency towards loss of probing attachment, both in shallow and deep pockets. The amount of attachment loss compared to the findings of Axelson & Lindhe (1978) who noted 0.1 to 0.3mm loss of attachment per year in untreated patients. In this context, it is of interest that Knowles et al. (1979) noted a small loss of attachment over the years in shallow pockets

in patients on maintenance therapy after various forms of surgical therapy.

Gingival recession seemed to account for most of the reduction in probing depth. The mechanisms responsible for this recession may be that in edematous tissues, the reduction of inflammation results in less tissue bulk thereby reducing the level of the marginal tissue.

The Perio-Aid® was instituted for attempted subgingival plaque control purposes after the effect of brushing and flossing had reached a plateau. The patients used in this study maintained supragingival plaque scores of less than 10%. Thus, they demonstrated motivation and dexterity and would be likely candidates for the use of an additional tool for subgingival plaque control attempts. However, there are obvious difficulties in measuring subgingival plaque and the assumption of proper use of the Perio-Aid® was based on demonstrated use of the tool by the patients and past effectiveness in supragingival plaque control efforts. The results of the study showed that there was no further change in any of the measured parameters after the introduction of the Perio-Aid® after the 5-month examination. It is possible that the patients were ineffective in their use of the Perio-Aid®, thus the lack of response. It is also a possibility that the disease could persist even when subgingival plaque

control is improved. Bacterial contaminants, i.e. endotoxins absorbed into the cementum of diseased roots have been demonstrated by Jones & O'Leary (1978). It is unlikely that removal of plaque from the root surface by a wooden toothpick is effective in removing contaminants from the cementum. If toxins absorbed into cementum play a role in periodontal disease as suggested by Aleo et al. (1974) and Aleo, DeRenzis & Farber (1975) they would remain active even after subgingival plaque control without any associated subgingival instrumentation and root planing.

In conclusion, the present study, perfromed over an 8-month period, demonstrated a limited change of gingival parameters in patients with gingival pockets of varying depth following plaque control without concomitant instrumentation. Also, the lack of response to the Perio-Aid® seems to indicate that the value of this tool in this type of patients is questionable.

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Figure 1

EXPERIMENTAL DESIGN

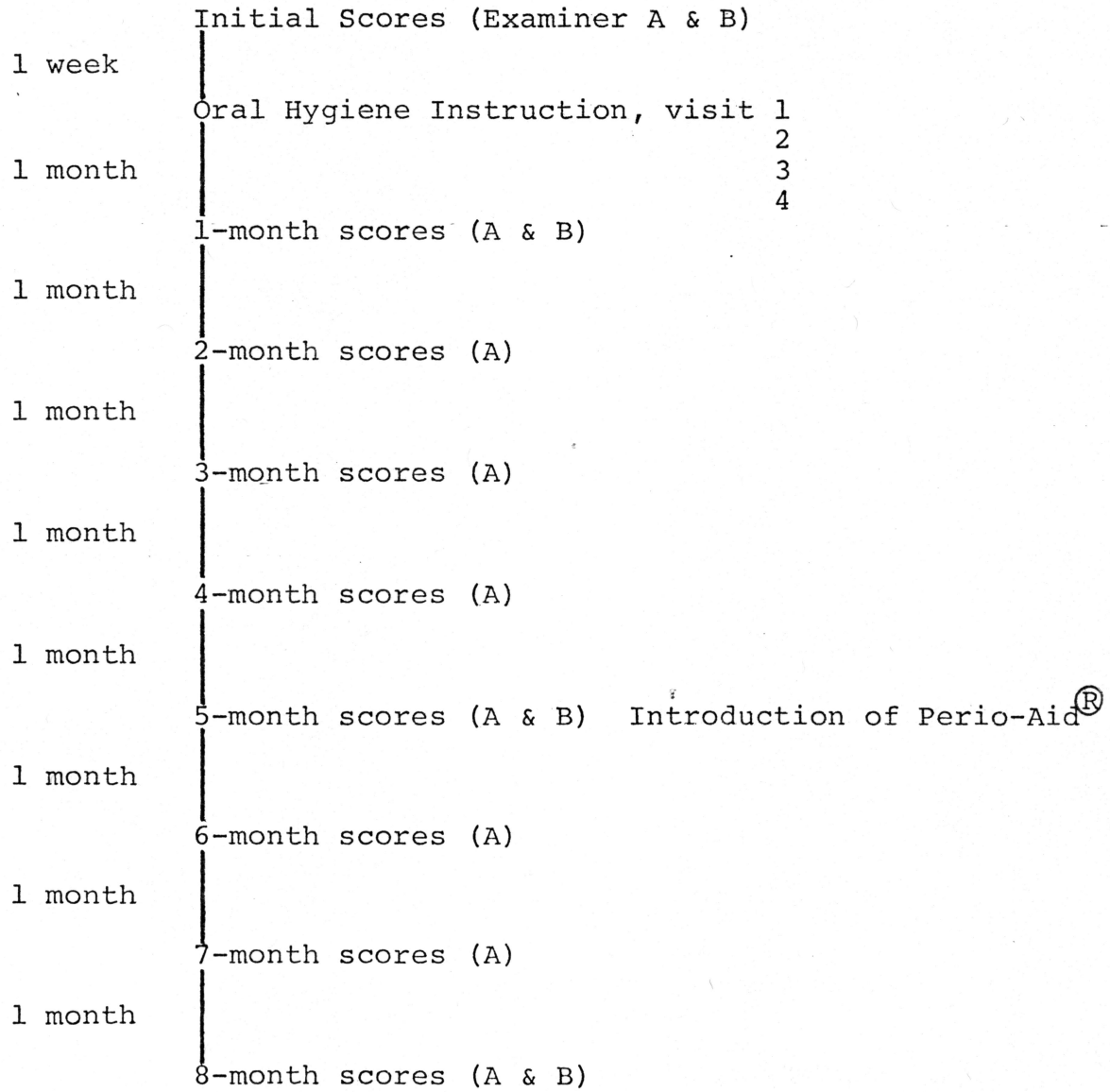

Table 1. Mean plaque scores (percent) at initial examination and at monthly intervals throughout the experimental period.

	Examination								
Patient	Ini-tial	1 month	2 month	3 month	4 month	5* month	6 month	7 month	8 month
1	74	2	0	4	2	3	0	10	4
2	38	4	3	0	0	15	3	3	10
3	92	5	8	8	6	6	18	8	7
4	61	6	6	14	3	3	3	8	3
5	83	11	13	10	9	11	22	5	20
6	71	7	16	9	10	10	4	3	6
7	99	7	1	13	2	4	0	14	15
Mean	74	4.4	6.7	6.9	7.3	7.4	7.1	6.9	9.3
±S.D.	20.4	2.2	6.0	4.8	4.8	4.6	9.0	4.1	6.2

* Introduction of Perio-Aid®

Table 2. Plaque scores (percent) by initial probing pocket depth and examination. Pooled surfaces.

Initial Probing Pocket Depth (mm)	Examination								
	Ini-tial	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
≤3.5 (N=279)	61	4	3	3	4	3	4	4	5
4.0-5.5 (N=202)	87	8	12	10	4	11	12	9	12
≥6.0 (N=179)	92	7	8	13	8	10	11	9	13

Table 3. Mean bleeding scores (percent) at initial examination and at monthly intervals throughout the experimental period.

Patient	Examination								
	Initial	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
1	70	61	54	48	49	40	36	32	44
2	43	33	22	25	28	21	25	22	24
3	89	68	68	49	46	42	51	48	48
4	56	44	50	25	39	25	31	31	19
5	89	62	41	43	37	37	44	45	43
6	57	62	31	44	56	50	41	53	42
7	98	96	84	85	60	71	70	69	75
Mean	71.7	60.9	50.0	45.6	45.0	40.9	42.6	42.9	42.1
±S.D.	20.7	19.8	21.3	20.1	11.2	16.6	14.8	15.9	18.2

Table 4. Bleeding scores (percent) by initial probing pocket depth and examination. Pooled surfaces.

Initial Probing Pocket Depth (mm)	Examination								
	Ini-tial	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
≤3.5 (N=279)	61	40	31	28	30	22	27	27	26
4.0-5.5 (N=202)	83	78	65	58	50	52	52	51	54
≥6.0 (N=179)	89	85	72	69	68	65	63	64	64

Table 5. Mean probing pocket depth (mm) at initial examination and at monthly intervals throughout the experimental period.

	Examination								
Patient	Initial	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
1	4.7	4.2	4.1	4.0	4.3	4.0	3.8	3.9	3.8
2	4.1	3.9	3.8	4.1	3.7	3.8	3.6	3.5	3.7
3	4.0	4.0	4.1	3.8	3.9	3.8	3.7	3.6	3.8
4	4.3	3.7	3.5	3.4	3.1	3.1	3.1	3.2	3.1
5	3.5	2.8	2.6	2.8	2.7	2.9	2.9	2.8	2.9
6	4.7	4.5	4.3	4.6	4.5	4.3	4.3	4.3	4.4
7	5.3	5.0	5.1	5.3	5.2	5.4	5.4	5.4	5.4
Mean	4.4	4.0	3.9	4.0	3.9	3.9	3.8	4.0	3.9
±S.D.	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8

Table 6. Reduction of probing pocket depth (mm) by surface and examination. Pooled surfaces.

	Examination							
	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
Proximal (N=440)	0.5	0.5	0.4	0.5	0.6	0.6	0.7	0.6
Buccal (N=110)	0	0.2	0	0.1	0.1	0.1	0.1	0.1
Lingual (N=110)	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3

Table 7. Reduction of probing pocket depth (mm) by initial probing pocket depth and examination. Pooled surfaces.

Initial Probing Pocket Depth (mm)	Examination							
	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
≤3.5 (N=279)	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2
4.0-5.5 (N=202)	0.3	0.3	0.4	0.3	0.5	0.5	0.6	0.4
≥6.0 (N=179)	0.7	0.8	0.8	0.9	0.8	0.8	0.9	0.8

Table 8. Mean change of probing attachment level (mm) at monthly intervals throughout the experimental period as compared to initial attachment levels.

	Examination							
Patient	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
1	-0.3	-0.2	0.1	0	-0.3	0.1	-0.2	-0.1
2	0	0.3	0.6	0.4	0.1	0.2	0.4	-0.1
3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.4
4	0.3	0.6	0.2	0.2	0.1	0.3	0.3	0.2
5	0	0.2	0	0.1	-0.3	-0.2	-0.2	-0.4
6	-0.1	0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.5
7	-0.5	-0.5	-0.4	-0.6	-0.6	-0.8	-0.8	-1.1
Mean	-0.1	0	0	-0.1	-0.2	-0.1	-0.2	-0.3
±S.D.	0.3	0.4	0.3	0.3	0.2	0.4	0.4	0.4

Table 9. Change of probing attachment level (mm) by surface and examination. Pooled surfaces.

	Examination							
	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
Proximal (N=440)	-0.2	0.0	0.0	-0.1	-0.2	-0.1	-0.2	-0.3
Buccal (N=110)	-0.3	-0.2	-0.2	-0.2	-0.4	-0.3	-0.4	-0.6
Lingual (N=110)	-0.2	0.0	0.0	0.0	-0.3	-0.2	-0.2	-0.4

Table 10. Change of probing attachment level (mm) by initial probing pocket depth and examination. Pooled surfaces.

Initial Probing Pocket Depth (mm)	Examination							
	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
≤3.5 (N=279)	-0.2	-0.1	-0.1	-0.2	-0.3	-0.2	-0.3	-0.4
4.0-5.5 (N=202)	-0.3	0.0	-0.1	0.0	-0.2	-0.1	-0.2	-0.4
≥6.0 (N=179)	-0.1	0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.3

Table 11. Mean gingival recession (mm) at monthly intervals throughout the experimental period as compared to initial location of gingival margin.

	Examination							
Patient	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
1	0.9	0.8	0.7	0.4	1.1	0.7	1.0	0.9
2	0.3	0.1	-0.1	0.1	0.3	0.3	0.3	0.5
3	0.3	0.2	0.4	0.3	0.4	0.5	0.5	0.6
4	0.3	0.1	0.7	1.0	1.0	0.8	0.8	1.0
5	0.7	0.7	0.7	0.8	0.9	0.8	0.9	0.9
6	0.3	0.3	0.3	0.5	0.6	0.7	0.7	0.8
7	0.8	0.6	0.4	0.6	0.5	0.6	0.6	0.9
Mean	0.5	0.4	0.4	0.5	0.7	0.6	0.7	0.8
±S.D.	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2

Table 12. Gingival recession (mm) by surface and examination. Pooled surfaces.

	Examination							
	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
Proximal (N=440)	0.6	0.5	0.5	0.6	0.7	0.7	0.8	0.9
Buccal (N=110)	0.3	0.3	0.3	0.3	0.5	0.4	0.5	0.7
Lingual (N=110)	0.4	0.2	0.3	0.3	0.5	0.5	0.5	0.7

Table 13. Gingival recession (mm) by initial probing pocket depth and examination. Pooled surfaces.

Initial Probing Pocket Depth (mm)	Examination							
	1 month	2 month	3 month	4 month	5 month	6 month	7 month	8 month
≤3.5 (N=279)	0.3	0.3	0.2	0.3	0.5	0.4	0.5	0.6
4.0-5.5 (N=202)	0.5	0.4	0.4	0.4	0.6	0.6	0.7	0.8
≥6.0 (N=179)	0.8	0.7	0.7	0.9	1.0	0.9	1.0	1.2

Table 14. Interexaminer reproducibility of recordings of probing pocket depth and probing attachment level. Number of surfaces and percent surfaces with differences of 0mm, ±0.5mm, ±1.0mm, ±2mm and ±≧2.5mm respectively.

Difference between duplicate recordings	Probing pocket depth		Probing attachment level	
	Number of Surfaces	Percent Surfaces	Number of Surfaces	Percent Surfaces
0mm	1251	40	1167	38
±0.5mm	1214	39	1246	40
±1.0mm	395	13	451	15
±1.5mm	148	5	146	5
±2.0mm	51	2	48	2
±≧2.5mm	49	2	50	2
Total	3108	101	3108	102